

# COSTOPTIMIZER®

## MATERIAL UTILIZATION COST ESTIMATION SOFTWARE



COSTOPTIMIZER® is a software solution that enables Cost Engineers to develop quotations and estimates for piece part costing by creating precise blank shape developments, performing initial formability risk assessment and establishing target costs for sheet metal components. Substantial material costs and weight reductions can be realized from optimizing nesting layouts and identifying critical nest points for minor changes to product design. COSTOPTIMIZER® provides the required information to evaluate multiple manufacturing scenarios for optimal material usage that generates cost and weight savings.

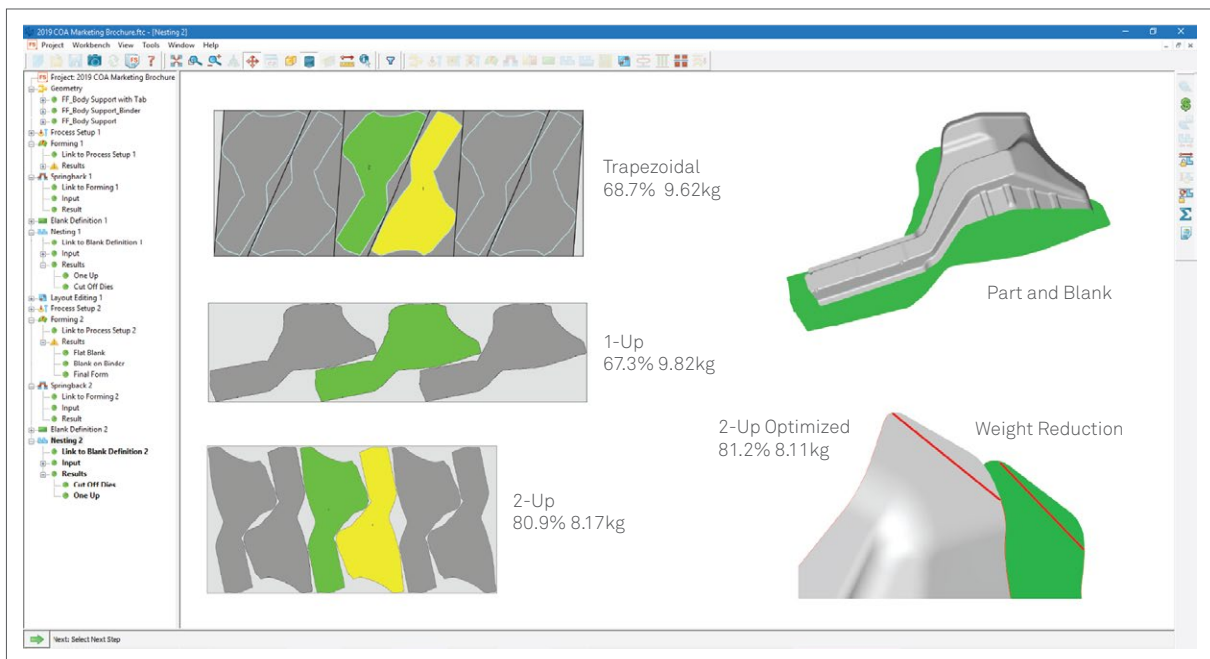
# COSTOPTIMIZER®

Cost Engineering is critical activity devoted to the management of project costs, involving such activities as estimating, cost control, cost forecasting, investment appraisal and risk analysis. The cost of a part is determined from geometric shape, material type, manufacturing process (progressive, transfer, tandem) and investment. By implementing a standard methodology for creating, tracking, analyzing and communicating the contents of a quote, an organization can impose a disciplined approach to the quotation process. The key objective of cost engineering is to arrive at accurate cost estimates and schedules and to avoid cost overruns and schedule slips.

COSTOPTIMIZER® uses a scientific physics-based approach to develop accurate blank shapes (CHI Solver) based on forming process, material properties and accounts for stretch and deformation of 3D product geometry. Cost engineers benefit from developing self-confidence (internal know-how), quick and accurate material projection, improving quote accuracy, suggesting product changes that impact material utilization, evaluating part manufacturing concerns, and promoting confidence and trust with your customers.

Several nesting layouts can be developed and evaluated to maximize material utilization based on coil width and pitch constraints. Nests are generated for 1-up, 2-up, 2 blanks and mirrored arrangements from coils for high volume production in line dies and progressive dies or low volume production from slit sheets.

Reports are automatically generated and used to determine Target Costs and provides a sound basis for vendor negotiations. COSTOPTIMIZER® provides major time savings for all quotes and allows costing engineers to turn around tooling quotes the same day with confidence in the results.



COSTOPTIMIZER® determines material utilization and enables cost and weight optimization

## FEATURES

- Cost engineers gain self-assurance in quoting and estimating sheet metal components
- Scientific, physics-based approach quickly predicts accurate material projection
- Improves quote accuracy to better position your company
- Suggests product design changes that impact material utilization
- Evaluates part manufacturability concerns
- Promotes confidence and trust with your customers/suppliers

# COSTOPTIMIZER® ADVANCED

FORMABILITY RISK ASSESSMENT, MATERIAL  
UTILIZATION COST ESTIMATION



COSTOPTIMIZER® ADVANCED combines the power of FTI's premier formability analysis, blank development, and blank nesting tools with specialized product and process optimization tools that help identify design changes that reduce material costs while significantly reducing the number of engineering design changes caused by formability issues. It is equally suited for line die or progressive die components and it can also identify product design changes that improve material utilization and reduce costs. COSTOPTIMIZER® Advanced provides the required information to evaluate multiple manufacturing scenarios for optimal material usage.

# COSTOPTIMIZER® ADVANCED

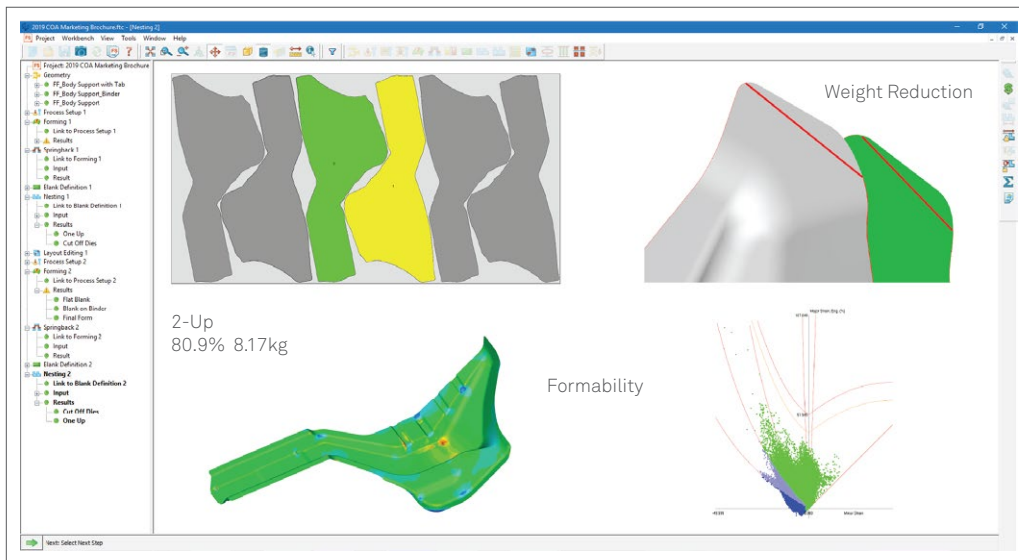
COSTOPTIMIZER® ADVANCED is used by cost engineers and product engineers to perform formability risk assessment, develop precise blank shapes, manage material utilization and establish target costs for sheet metal components. Piece part costing and material estimating is performed with confidence due to FTL's proprietary Coupled Hybrid Inverse (CHI) solver for fast and accurate results. Substantial material costs and weight reductions for BIW components can be assessed and monitored.

FTI's proprietary Coupled Hybrid Inverse (CHI) solver is used to predict formability (splits/wrinkles) and springback issues to reduce ECOs, develop blank size, determine material utilization and weight. Costing/Product engineers can evaluate multiple manufacturing layouts to derive an optimized process.

Several nesting layouts can be developed and evaluated to maximize material utilization based on coil width and pitch constraints. Nests are generated for progressive dies, transfer and tandem dies for standard shaped cut-offs, 1-up, 2-up, 2 blanks and mirrored arrangements from coils for high volume production in line dies and progressive dies layouts or low volume production from slit sheets.

Component strains and thinning information can be uploaded to CAE Departments to increase accuracy of component performance for structural, crash, NHV, fatigue and durability analysis. Studies have shown that using this thinning and work hardening information can increase CAE accuracy up to 30%.

Reports are automatically generated to summarize product design issues and material utilization. This information is used to determine Target Costs and provides a sound basis for vendor negotiations.



COSTOPTIMIZER® ADVANCED determines material utilization and enables cost and weight optimization

## FEATURES

- Identifies product design changes that improve material utilization and reduce costs
- Scientific physics-based approach predicts formability issues and determines total material cost per blank
- Predicts formability and calculates blank size accounting for binder, pressure pads, blank holder forces, and pilot holes/slots
- Accurately identifies material thinning and gathering conditions on Forming Limit Diagram (FLD), Safety Zone in addition to Thickness Strain, Major/Minor Strain, etc.
- Calculates Springback to predict issues for tooling and generates compensation file for export to CAD
- Evaluates multiple manufacturing scenarios for optimal material usage
- Automatically generate reports to summarize product design issues and material utilization



# COSTOPTIMIZER® PROFESSIONAL FOR LINE DIES

COST ENGINEERING, MATERIAL UTILIZATION  
AND PROCESS PLANNING FOR LINES DIES

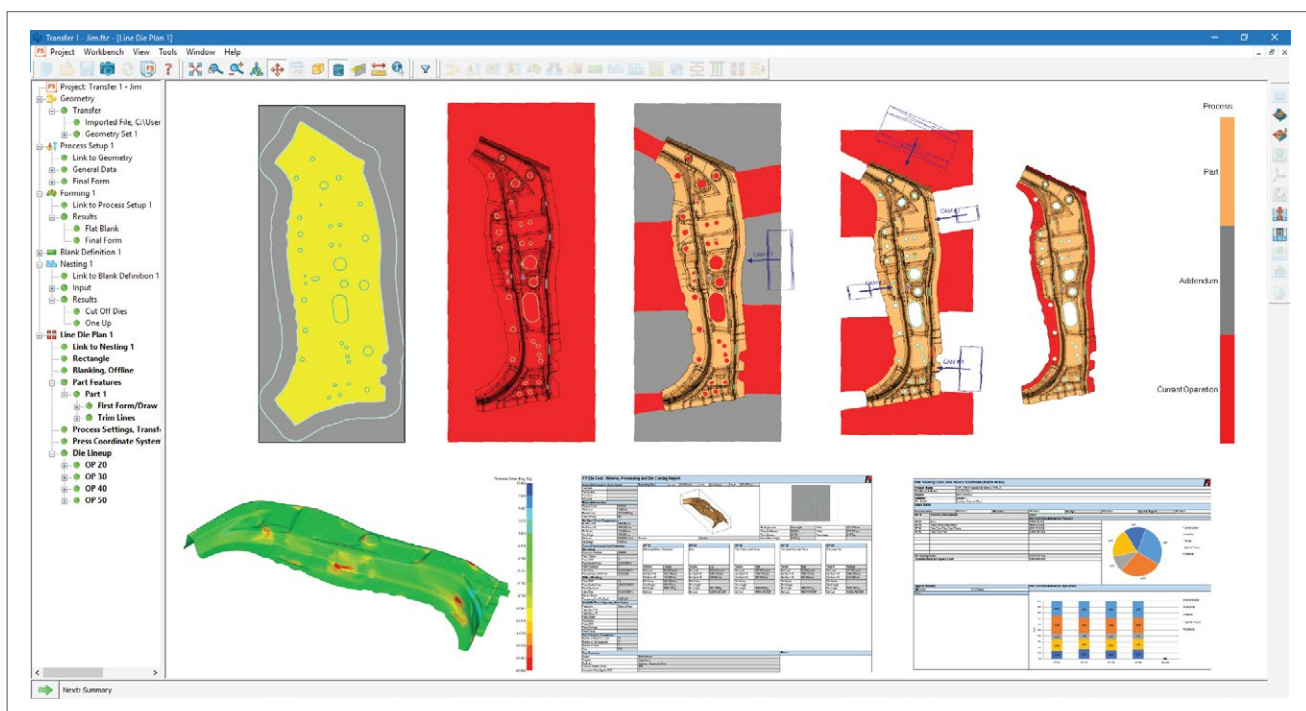


COSTOPTIMIZER® PROFESSIONAL combines the power of FTI's premier formability analysis, blank development, and blank nesting tools with specialized product and process optimization tools that help identify design changes that reduce material and processing costs. It creates a documented process plan including press requirements and determines number of operations, tonnage, and detailed costing for transfer, tandem, and progressive dies.

# COSTOPTIMIZER® PROFESSIONAL FOR LINE DIES

COSTOPTIMIZER® PROFESSIONAL is a software solution that establishes target costs and formability for sheet metal components and their tooling. It provides users with a fast and accurate method for creating and documenting process plans, verifying formability, developing blank shapes and coil nests, and for identifying product and process design changes that lead to substantial cost reductions.

The process plan is based on part features such as flanges, holes, trimming and trim sections. It describes the processing sequence and the detailed actions in each operation. Processing rules are used to automatically derive an initial plan and fast intuitive tools enable process customization and optimization. The validation engine ensures that process actions and sequence conform to physical, mechanical, and processing rules. The advanced capabilities make it ideally suited to product and process engineers, as well as purchasers, planners, estimators and account managers.



COSTOPTIMIZER® PROFESSIONAL combines cost engineering, material utilization, cost & weight optimization and process planning

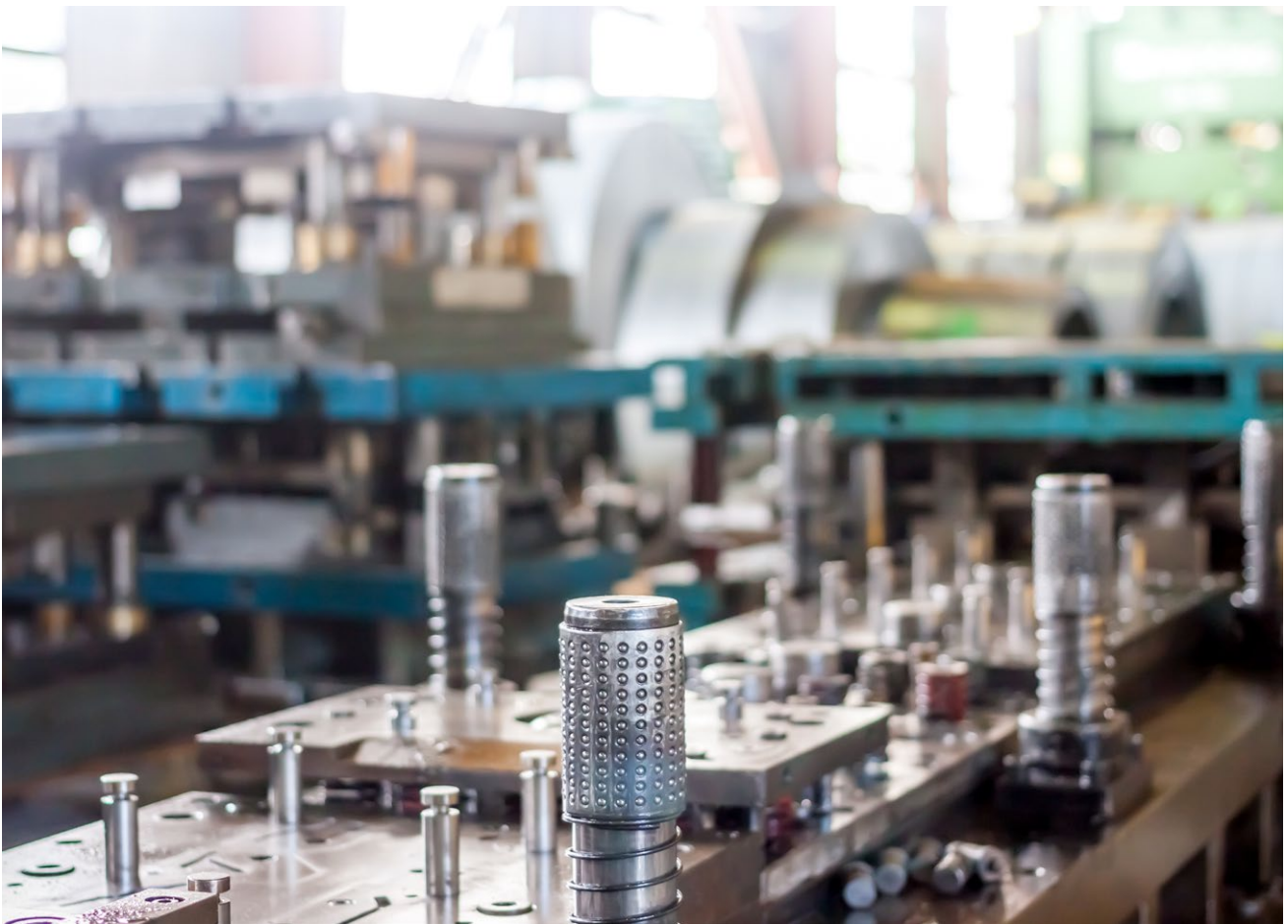
## FEATURES

- Establishes target cost for piece price and tooling with a detailed process plan for quoting
- Generates images to detail die actions in each operation
- Results in increased accuracy and enables a faster quoting process
- Scientific physics-based approach to process planning validated by OEMs and Tier 1 suppliers worldwide
- Calculates press requirements such as tonnage, bed size, shut height, energy, and selects appropriate press
- Consistent and repeatable method for estimating tooling costs with detailed reports that connect to any system



# COSTOPTIMIZER® PROFESSIONAL FOR PROGRESSIVE DIES

COST ENGINEERING, MATERIAL UTILIZATION  
AND PROCESS PLANNING FOR PROGRESSIVE DIES

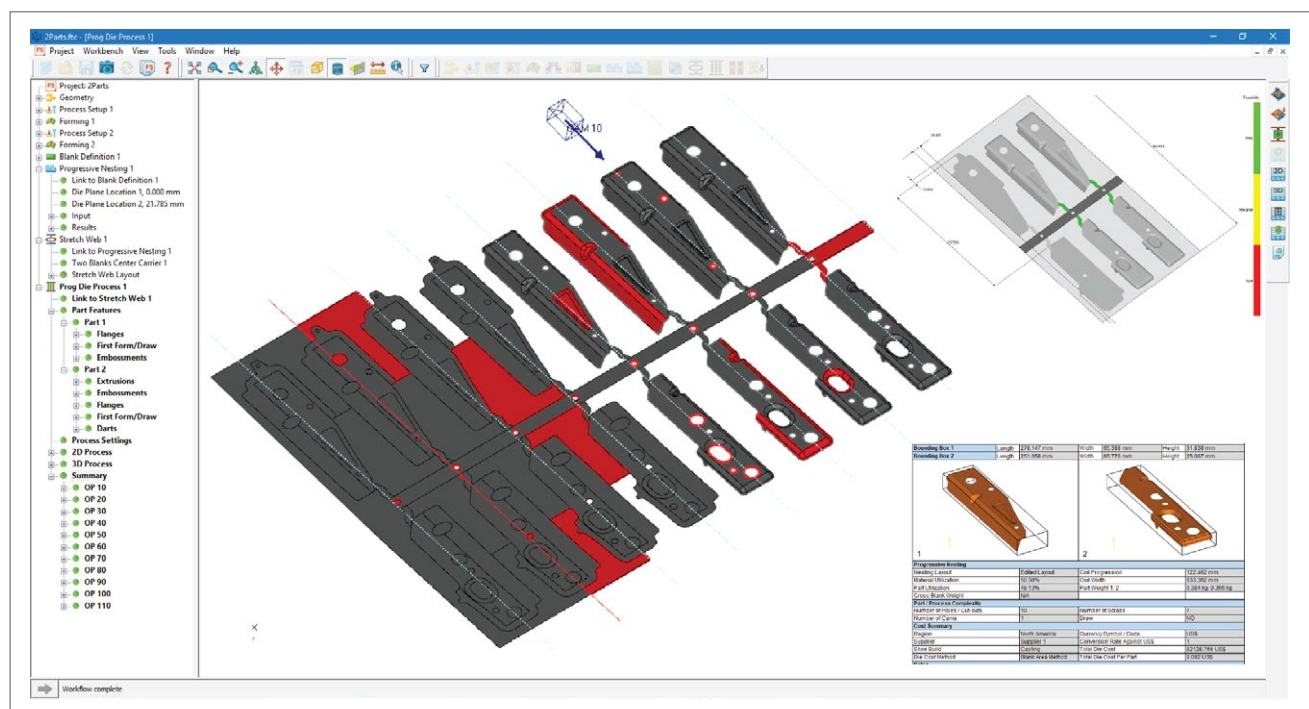


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## FEATURES



# FASTFORM® ADVANCED

BODY IN WHITE FORMABILITY ASSESSMENT, SPRINGBACK ANALYSIS AND BLANK SHAPE DEVELOPMENT



FASTFORM® ADVANCED enables users to quickly and easily evaluate part and process feasibility as well as determine blank shape and springback. It identifies formability problems enabling users to implement design changes earlier in the product life cycle, saving time and money. Before releasing data to tooling, engineers should run FASTFORM® Advanced to assess formability risks. It considers component or tool geometry and accounts for material properties, friction, binder, addendum, blank holder force, pad pressure, draw-beads, and tailor-welded blanks.

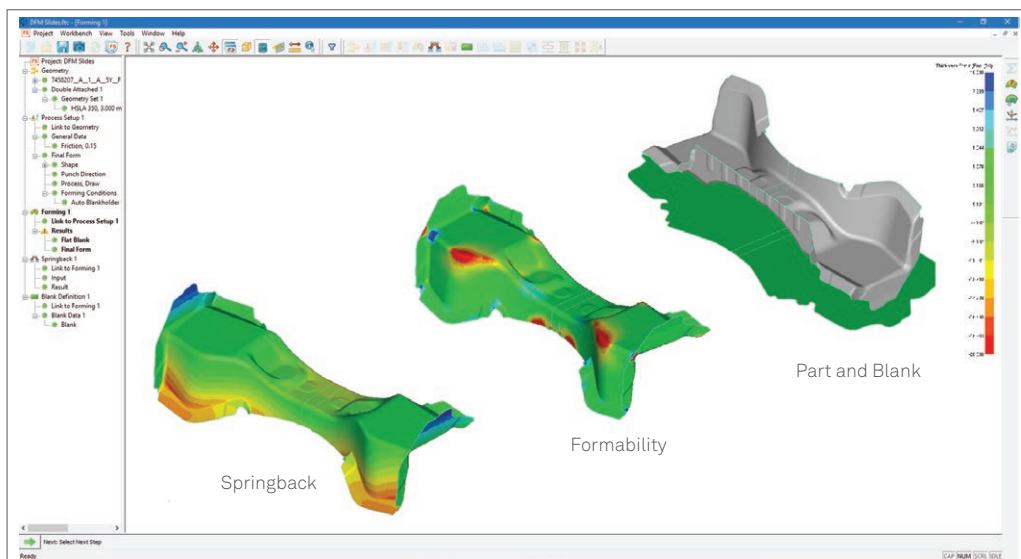
# FASTFORM® ADVANCED

FASTFORM® ADVANCED uses FTI's proprietary Coupled Hybrid Inverse (CHI) solver for fast accurate results. It enables design engineers to apply Key Product Requirements (KPR) and Design for Manufacturability (DFM) principles. This technology introduces the concept of designing BIW components so that geometry can be evaluated for formability and manufacturing-based issues can be minimized. KPR/DFM strategies will expose design problems early in the New Product Introduction process so that fewer Engineering Change Orders (ECO) are issued from tooling.

KPR techniques are used to review Class A surfaces while the clay models are still in Styling. The KPR analysis addresses issues such as cosmetic quality, surface distortion for mating surfaces (hole tolerances, master locators), dent resistance, continuity of reflect lines, continuity of features, slip lines and thinning. KPRs significantly affect the product's safety, compliance with governmental regulations or is likely to significantly affect customer satisfaction (quality) with a product.

DFM techniques are used on Class B and C Body-In-White (BIW) components. Product designers can evaluate several forming scenarios. Engineers can predict formability issues and account for processing conditions such as binder, pressure pads, blank holder forces, and pilot holes/slots. Formability assessments are accurately described on the Forming Limit Diagram (FLD), Safety Zone, Thickness Strain, Major/ Minor Strain, and Springback plots.

Component strains and thinning information can be uploaded to CAE Departments to increase accuracy of component performance for structural, crash, NHV, fatigue and durability analysis. Studies have shown that using this thinning and work hardening information can increase CAE accuracy by 30%.



FASTFORM® ADVANCED determines material utilization and enables cost and weight optimization

## FEATURES

- Identifies product design changes that improve quality, material utilization and reduce costs
- Scientific physics-based approach identifies formability issues at product design stage
- Predicts formability and calculates blank size accounting for binder, pressure pads, blank holder forces, and pilot holes/slots
- Accurately identifies material thinning and gathering conditions on Forming Limit Diagram (FLD), Safety Zone in addition to Thickness Strain, Major/ Minor Strain, etc.
- Calculates Springback to predict issues for tooling and generates compensation file for export to CAD
- Evaluates multiple manufacturing scenarios for optimal material usage
- Automatically generates a report to summarize product design issues and material utilization